

A view in the United Grain Growers Elevator, Port Arthur, Ont. through which much Europe-bound grain taken from lake freighters has moved.. After elevation grain waits in hoppers above for clearing of the previous load from the scales shown here—a fast operation.

# Grain

AUGUST 1949

THE MAGAZINE OF PLANT MANAGEMENT AND OPERATION

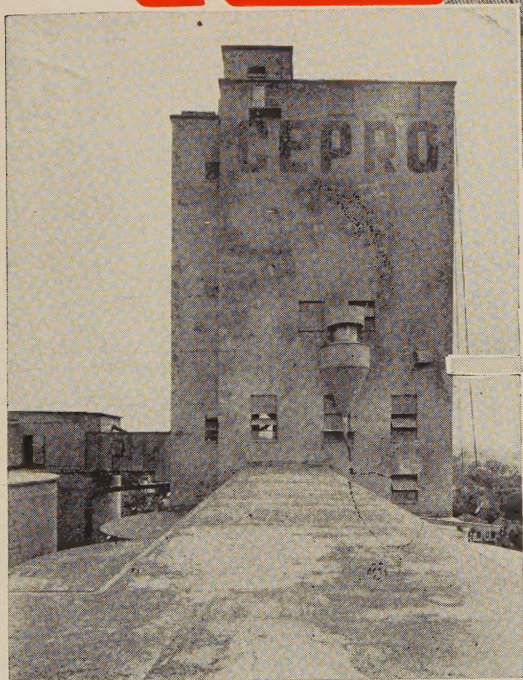




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# Grain

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AUGUST 1949

## THE MAGAZINE OF PLANT MANAGEMENT AND OPERATION

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# Theory and Fact in the Problem of SICK WHEAT

BY MAX MILNER

Kansas Agric. Exper. Sta., Manhattan, Kans.

OUR very first problem is to obtain an adequate definition of sick wheat. One grader claims that it is difficult to define sick wheat in a language that is commonly understood; in a manner to distinguish it from other closely related types of wheat damages.

Another grading authority believes that all types of damage to wheat function together and that he would not attempt to identify sick wheat as a particular type of damage.

The Canadian grain standards do not recognize the existence of a type of wheat damage requiring the use of a special term such as "sick", to differentiate it from moldy or bin-burned wheat. We know, however, that the same hard spring wheats which may become sick in this country are widely grown in western Canada and are harvested and stored under similar conditions to those encountered here.

### Mold as Cause Meets Opposition

One capable investigator claimed sick wheat is that grain which is killed by molds growing on the kernels, but he makes no reference to the dark coloration of the germ which is supposed to be the primary characteristic for identification of sick wheat.

Another group of careful experimenters produced sick wheat in the laboratory, that is, wheat which was graded sick by Federal inspectors, yet they eliminated all samples which showed even a trace of mold growth.

Some capable storage supervisors insist that sick wheat is a condition independent of mold growth, whereas certain grain inspectors, when asked to co-operate with a scientific experiment on this subject by selecting and submitting representative samples of sick wheat, invariably provided grain which showed extensive mold contamination in addition to the darkened germ.

These inspectors, incidentally, were not the same individuals who graded the sick wheat in the series previously referred to from which all moldy samples had been removed.

### A Few Theories

A foremost cereal chemist believes that the enzymes of the molds which grow on wheat are the direct cause of darkening and deterioration of the germ.

Let us continue this excursion into

WHENEVER elevator superintendents get together the conversation sooner or later will drift around to "sick wheat". We want to know more about it. We've probably always had "sick wheat" but recognition was not given to it until comparatively recent times. The author of this article declares: "When discussing sick wheat, one is immediately in a dilemma, due to the lack of clear descriptive terminology dealing with grain deterioration as well as considerable misunderstanding of the fundamental factors involved. One hesitates, therefore, to attempt a direct answer to the question of "just what is sick wheat?" This question has been put to many individuals who are authorities in the field, and the variety of answers which have been given leaves one quite confused. It would seem useful, however, to thread our way through the maze of frequently contradictory evidence on the nature and causes of sick wheat, and to arrive, as far as possible, at solid and definitely helpful facts."

confusion by examining the various theories which have been put forward to explain the cause of sick wheat formation. As has been indicated, one research worker believed sick wheat to be that which has been killed by the toxic effects of molds growing on the grain. Another theory is that sick wheat arises when the grain tries to germinate but is unable to do so due to insufficient oxygen.

Weathering of grain in the field has been suggested as a cause, as also has been storage at high moisture. The fermentation due to bacterial growth has been put forward as a factor.

There is a considerable body of opinion which holds that sick wheat is a transmissible disease and that such wheat can infect sound grain which comes in contact with it.

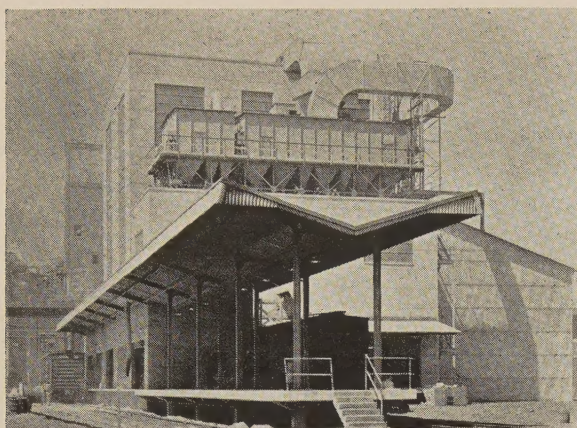
It also has been suggested that sick wheat arises due to an interference with the normal ripening process of wheat, such as would occur if the grain is harvested too early. This theory probably is based on the circumstantial evidence that

JUST before I left New Orleans, there was a luncheon call from Charles Winters, SOGES president. So we went over to International House (which has food that even the famed French Quarter can't surpass) and we talked of many things. We discussed Grain (the industry and the paper), past, present and future. And, of course, capable, energetic, ambitious Charlie was filled with plans for SOGES progress. I rather think he's going to fulfill these plans. Said he:

"It is essential that we elevator superintendents not only be members of SOGES but take advantage of it. Paying dues helps an organization financially, but the member who does nothing else is not getting all the value that he can. The most benefits accrue to those who take an active part in the work. They'll take away more than they give."

*Now*





**NEW FEED PACKING HOUSE** at A. E. Staley Mfg. Co., Decatur, Ill., has its own rail siding where three cars can be loaded at once. Spout along platform connects with bulk loading equipment. Most bagged feed is loaded by manierre loader which takes bags into all parts of the box cars.

the occurrence and quantity of sick wheat in the past 20 yrs. have coincided with the appearance and increased use of the combine harvester. Conclusive proof remains to be produced that these various factors are involved in this problem.

#### **Grain Respires Above**

From among this mass of theory and circumstantial evidence let us attempt to extract some factual information about sick wheat. We know that wheat is a resting form of life and that the embryo which is the seat of such life is very sensitive to deteriorative factors. At moisture values **below** about 14%, most grain will store safely for indefinite periods if the temperature of storage is not excessive.

At moisture values beyond this point the grain will begin to respire and heat. The critical point where this deterioration sets in, is not precisely fixed but varies somewhat with the commercial quality of the grain, the extent of physical damage, grain condition, location of storage, etc.

Generally, of course, the poorer the condition and the lower the commercial grade, the lower is the critical moisture at which respiration and heating begin.

#### **Mold Growth Responsible**

The primary factor responsible for the heating and spoilage of wheat at moisture values in excess of 14% is mold growth. The molds involved are the common type occurring everywhere and are commonly seen on decaying plant, animal, and food materials. These micro-organisms are vigorous producers of heat and of enzymes which cause the deterioration.

After mold growth has proceeded for some time the kernel may show a darkened and discolored germ. However, the germ of the grain contributes very little to the respiration and heating effects at moisture values above 14%, unless the moisture is so high that the process of seed germination sets in. The initiation of germination, however, can not be expected until the moisture value is over 20%.

The important fact to be stressed

is that the major process responsible for the deterioration of seed at elevated moisture values as manifested by respiration and heating, is the growth of molds whose spores always occur in sound wheat. The seed contributes virtually nothing to the heating process at moisture levels below that required for germination.

#### **Enzymes Cause Deterioration**

On the other hand, if very extended storage intervals are involved and if higher than average temperatures are encountered, deteriorative changes due to enzymes and other factors in the seed make themselves evident. It has been difficult to supply proof for this statement since under natural conditions of storage where the moisture is excessive, mold deterioration proceeds to a drastic extent before the slower deterioration due to the seed can be demonstrated.

In other words, under natural conditions of storage mold deterioration such as occurs at unsafe moisture levels will mask completely the more slowly developing deterioration occurring within the seed. In spite of this difficulty it has been possible to demonstrate this type of seed deterioration by applying storage conditions under which mold growth is minimized.

Thus by storing soft red winter wheat at low moisture levels but at elevated temperatures, research workers of the United States Department of Agriculture have found that darkened germs can occur in the absence of mold growth. In one experiment grain at 12% moisture was stored at 104°F. for one year with the appearance of 40% of sick kernels, free of mold growth.

#### **Drastic Temperatures Required**

This indicates that drastic temperature conditions are required to produce sick wheat at a "safe" moisture value. Other workers stored hard red spring wheat at 18% moisture under an atmosphere of nitrogen. After several months of storage they too obtained grain with darkened germs but without significant increase in mold growth.

It must be stressed that under nat-

ural conditions of storage, mold growth, darkened germ, and increases in fat acidity usually occur together. The darkened germ, however, does not appear to be the result of mold growth since it may be produced at a slow rate under conditions where molds will not proliferate.

What, then, do these facts mean in practical terms?

It seems fairly safe to conclude that most sick wheat of commerce is also moldy. This would indicate that at one time in their history the affected kernels contained moisture in excess of the critical value, that is, over about 14%.

One could safely venture the prediction that if the moisture content of all commercial grain were kept **below** 14% from the time of harvest, the incidence of sick wheat would decrease drastically.

#### **Dry It and Keep Cool**

There is no better method known to cut down storage loss of grain than to dry it and keep it dry. It was indicated, however, that darkened germ and increased fat acidity may nevertheless occur in dry grain at high temperatures after extended storage periods. Such deterioration can only be controlled by turning and cooling of grain, with judicious regard to prevailing humidity and temperature conditions.

The fat acidity increase which is characteristic of sick wheat provides a very sensitive index of the onset of this condition. The determination of this factor is quite simple and provides a warning that deterioration is in progress. Wider use of this test as an adjunct to good grain storage practice is highly recommended.

One might assume from the foregoing that sufficient information exists to suggest methods for the prevention and control of sick wheat even in grain which is stored under conditions favoring its occurrence. This is far from the truth.

As yet we have little information on the mechanisms responsible for sick wheat. Considerable research remains to be done along these lines. To eliminate the confusion which surrounds our present knowledge, the problem must be broken down into its various components and these must then be attacked vigorously.

Once the causes and mechanisms are known, control should not prove too difficult. It would be useful here to list a few of the factors in this problem which must be clarified.

#### **Prevent Losses Through Treatments?**

The first requirement is a clear picture of the quantitative effect of sick wheat on the commercial quality of grain. To what extent are various percentages of sick wheat in a lot of grain reflected in a reduction of wheat quality from the milling and baking viewpoint? Are some

(Concluded on page 15)



# Comparative Effectiveness of Methods For Controlling Insects in Elevator Boots

By B. N. SMALLMAN and F. L. WATTERS  
*Stored Insect Laboratory, Winnipeg, Man.*

ELEVATOR boots are notoriously subject to insect infestation and were the only type of equipment examined in this study. The treatments tested were of the type used for local disinfestations between general fumigation. Nine different treatments for the control of insects in elevator boots were tested.

The tests were carried out in three large milling plants of approximately 9800 sacks capacity. In each plant, five boots were assigned to each of the nine treatments; thus, in all three mills there were 15 boots under such treatment and 135 boots under all treatments.

Representative samples of stock were taken from each boot at monthly intervals over a 6-month period and examined for the number of living insects. Thus, the final assessment of the effectiveness of each treatment was based on the number of insects recovered from 90 samples taken over the 6-month period.

The first application of treatments was made in July. At this time, the plant that had been frozen out in January showed moderate to severe infestation of the boots, and the plants fumigated in April showed very light infestation. Thus, the boot treatments were tested against degrees of infestation from severe to light as would be the case in practice.

Groups of five boots were chosen on a formal random basis and assigned to each of the nine treatments. The random assignment of boots to the various treatments insured equal opportunity for boots of different sizes and carrying different types of stock to be represented under the given treatment.

The relative effectiveness of the treatments was assessed by comparing the average number of living insects recovered from the 15 boots under each treatment in the three plants over the six monthly examinations.

As would be expected, large differences were often found in the number of insects recovered from boots under the same treatment, and the averages alone are not entirely reliable for indicating differences between treatments. A statistical test, Fisher's "t" test, was therefore applied to determine the significance of observed differences between averages.

## Application of Treatments

The treatments were chosen to determine the efficiency of certain normal practices for the control of insects in elevator boots and to compare them with certain innovations.

The normal practices tested were: Periodic cleaning of boots; application of pyrethrum mill spray; and applications of two proprietary spot fumigants, one containing acrylonitrile and the other, ethylene dibromide as the principal toxicant.

The choice of fumigants enabled comparison of a highly volatile compound (acrylonitrile) with a compound of relatively low volatility (ethylene dibromide) to test the hypothesis, recently elaborated by the senior author, that fumigants of low vapor pressure are most likely to meet the special requirements for spot fumigation.

The innovations were: Applications of pyrenone spray to boots alone and to both boots and legs; and application for each of two fumigants, ethylene dibromide and dichloroethyl ether, as a pure compound deposited in small quantity on blotters placed on the floor of the boots.

Pyrenone was chosen because it is claimed to have residual properties and appear to be non-toxic to warm-blooded animals. Dichloroethyl ether is reported to be highly insecticidal and has a lower vapor pressure than ethylene dibromide; each fumigant was deposited on blotters to obtain uniform distribution of the small quantity applied. Moreover, it was thought that placing the soaked blotters on the floors of the boots, under the dead stock, would help to retain the fumigant and extend the period of insecticidal effectiveness.

Details of the application of treatments are shown in Table I. The dosages and methods of application for the two proprietary spot fumigants, acrylonitrile mixture and ethylene dibromide mixture, were governed by the manufacturer's recommendations. For very small boots, the recommended dosage for the ethylene dibromide mixture was reduced to 10 ounces. Ethylene dibromide alone was applied at 2 ounces per boot to give approximately the same quantity as contained in the manufacturer's recommended dosage for the ethylene dibromide mixture; dichloroethyl ether was applied at the same dosage for purposes of comparison.

Pyrethrum extract was applied as a 5 per cent solution in deodorized kerosene in the form of a coarse, wetting spray. Pyrenone concentrate, diluted 1:9 in deodorized kerosene, was also applied to boots as a coarse, wetting spray, which experience had shown would result in a deposit of about 100 milligrams of piperonyl butoxide

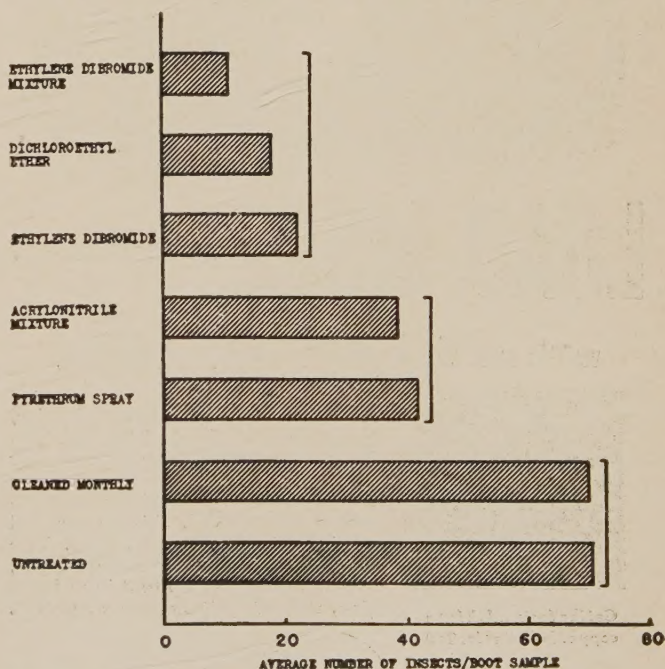


Fig. 1

Comparative efficiency of treatments applied in elevator boots at monthly intervals. Columns represent average number of insects recovered from 90 samples taken from five boots in each of three milling plants over a six-months period. Brackets indicate no significant difference ( $P > 0.05$ ) between the averages represented under the bracket; significant differences were demonstrated between bracketed groups ( $P < 0.05$ ).



TABLE 1—DETAILS OF TREATMENT

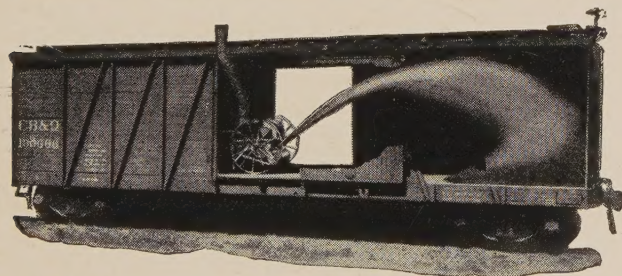
Treatment	Dosage	Method of Application
Acrylonitrile, 50% in carbon tetrachloride	3 oz./boot	Through hand-hold or down slides. Monthly.
Ethylene dibromide, 15% in chlorinated solvents	12 oz./boot	Through hand-hold or down slides. Monthly.
Ethylene dibromide	2 oz./boot	On blotter on floor of boot. Monthly.
Dichloroethyl ether	2 oz./boot	On blotter on floor of boot. Monthly.
Pyrethrum extract	1:19 in oil as a coarse, wetting spray on all inside surfaces of boot. Monthly.	
Pyrenone concentrate*	1:9 in oil as a coarse, wetting spray on all inside surfaces of boot. Every second month.	
Pyrenone concentrate*	In boots as above, and into legs as an aerosol at 1:1 in oil. Every second month.	
Cleaning of boots	Monthly.	No treatment.

\*10% piperonyl butoxide plus 1% pyrethrins.

and 10 milligrams of pyrethrins per square foot of sprayed surface.

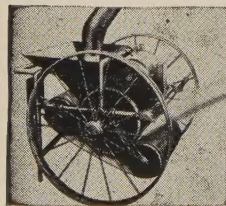
The amount of pyrenone introduced into the legs as an aerosol was calculated to give the same deposit on all inside surfaces of the leg, and was based on the known rate of delivery of the aerosol generator; but in actual practice most of the aerosol appeared to condense on the inside of the leg opposite the point of application.

All treatments were applied when the milling plants were closed down over week ends. Excepting the pyrenone treatments, all treatments were applied monthly.



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The proprietary fumigant mixtures were poured down the slide or through the hand-hole, and thus flowed into the dead stock in the boot. With the treatments involving the introduction of blotters, the dead stock was first removed and then thrown back into the boot on top of the fumigant-soaked blotter.

All spray treatments were applied after removal of the dead stock, and the boots were left empty until filled again by the normal operation of the plant. Pyrenone was applied every second month in order to provide an opportunity for demonstrating an advantage that might accrue from its residual properties. The pyrenone aerosol was produced by a dry-steam aerosol generator and intro-

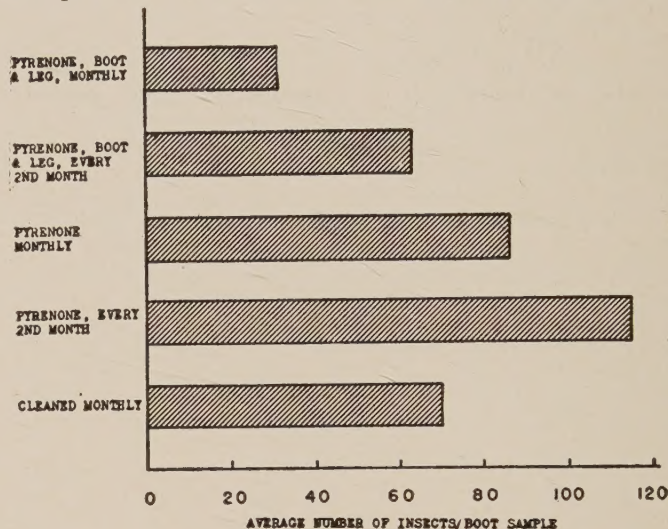


Fig. 2

Efficiency of pyrenone treatment of boots, and legs, as compared with monthly cleaning of boots. Columns represent average number of insects recovered from 90 samples taken from five boots in each of three plants over a 6-month period, except columns for monthly treatment with pyrenone which represent the average of 45 samples from five boots in three milling plants over 3 months.

duced into the legs through holes drilled in both "up-side" and "down-side" of each leg on each floor of the mills.

### Sampling Procedure

The 45 boots under observation in each milling plant were sampled once a month over the 6-month period, July to December. A representative sample was obtained by removing the dead stock from each boot, mixing it thoroughly in a large container, and taking a standard volume sample from various parts of the mixture.

The remaining stock was then returned to the boot, except for boots treated with pyrethrum or pyrenone spray, and the boots that were cleaned monthly. Counts of live adult insects present in samples taken from cleaned boots and from boots treated with pyrenone were made immediately to provide a measure of the extent of invasion of the boots, and the protection against invasion afforded by treatment of the legs.

These samples and all others were then incubated for two weeks at 27°C. and 75% relative humidity. This step was necessary to permit most eggs and larvae in the samples to develop to the adult or pupal stage so that they could be recovered from the coarser stocks. Final assessment was based, therefore, on the number of adults and pupae present in each sample.

### Results

Almost all insects recovered in the boot samples were confused flour beetles, *Tribolium confusum* (Duv.), or flat grain beetles, *Laemophloeus minutus* (Oliv.). In the 15 untreated boots over the entire six-month period, 55% of the insects recovered were flat grain beetles, and remaining 45% were mainly confused flour beetles.

Confused flour beetles were almost invariably present in all samples, whereas flat grain beetles were often absent; but where flat grain beetles were present, usually in



boots carrying coarse, branny stocks, they often occurred in very large numbers. The numbers of both species showed a general increase from July to October and then declined.

#### Relative Effectiveness of Cleaning, Spot Fumigation, and Mill Spray

Fig. 1 shows the effectiveness of monthly cleaning and of monthly applications of four types of spot fumigants and a pyrethrum mill spray, as compared with no treatment.

Monthly cleaning of the boots resulted in no significant reduction in the number of insects as compared with untreated boots. This is an important finding, for it indicates that boots are subject to heavy invasion of insects from some outside source. If this is indeed the case, then infestation of elevator boots is not a separate problem but merely a local symptom of a more general condition.

The most likely source from which insects might invade the boots is the elevator legs. This suggestion appears to be confirmed in a later section of our study where it is shown that treatment of the legs results in marked reduction in the number of insects present in the associated boots.

Fig. 1 shows that monthly treatment of boots with pyrethrum mill spray resulted in a significant reduction of the number of insects as compared with untreated or cleaned boots. However, the degree of control obtained cannot be considered satisfactory, and a high degree of control would scarcely be expected because insects present in the dead stock remain unaffected unless they come in prolonged contact with the treated bottom or sides of the boot. Moreover, the pyrethrum deposited on the surfaces of the boot would not be expected to remain insecticidal for any appreciable length of time.

The acrylonitrile fumigant mixture failed to give significantly better control than the pyrethrum mill spray. This result is attributed to its high volatility. An elevator boot is essentially an open box from which a volatile gas will quickly escape. Therefore, although such a gas may be highly effective against insects present at the time of

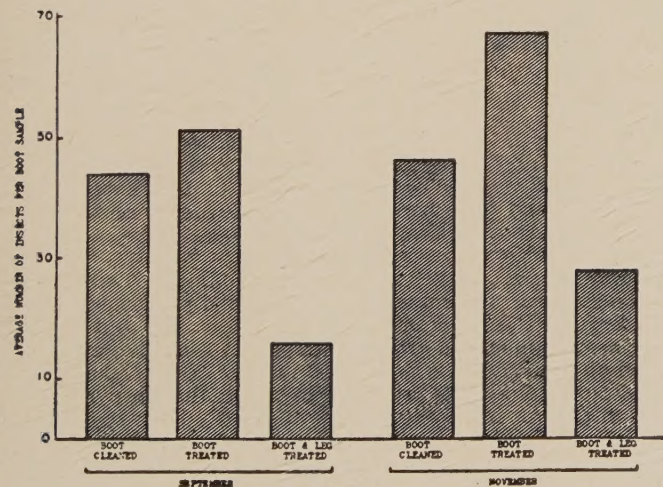


Fig. 3

Numbers of insects invading boots cleaned and treated with pyrethrum 28 days previously, and the protection against invading insects afforded by treatment of legs with pyrethrum. Columns represent average number of adult insects recovered from 15 samples taken from five boots in each of three milling plants.

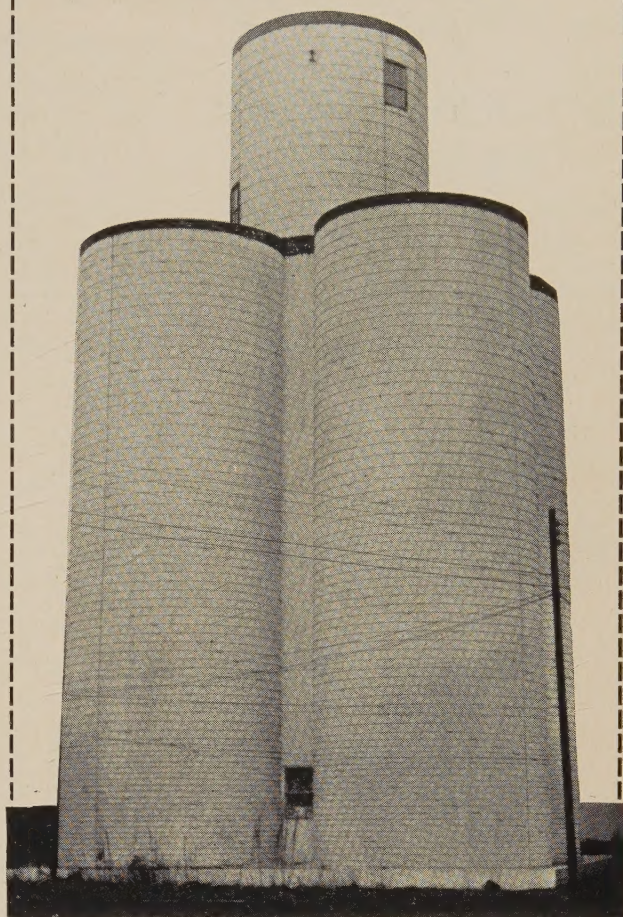
application, it will not be retained to protect the boot against subsequent invasion.

The results obtained with the acrylonitrile mixture suggest that the gas was not retained in the boots long enough or in sufficient quantity to prevent numbers of insects from entering the boots, presumably from the legs.

In Fig. 1 it is also shown that the most efficient treatments were those in which the fumigants, ethylene dibromide, and dichloroethyl ether, were applied at monthly

(Concluded on page 14)

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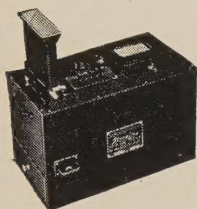
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## Elevator News

### SYCAMORE HAS NEW STORAGE

The Sycamore (Ohio) Mill & Supply Co. has completed construction of 12 concrete grain storage bins of 150,000 bus. capacity. The cupola is being built and it is expected to have the new structure completed in time for most of the harvest.

### EXPANSION IN DECATUR

Sol Tick & Co., Decatur, Ill., have remodeled and repaired the 40,000-bu. grain storage tank and mill warehouse of the former Shellabarger Mills, and are storing grain. The firm bought the property about a year ago, and has installed loading and elevating machinery. Mr. Tick plans to expand the grain storage facilities to approximately 150,000 bus. at a future date. He is now confining his grain business to storage.

### GALVESTON'S NEW GRAIN SACKING PLANT

A new grain sacking plant has been placed in operation by the Galveston Wharves just east of Elevator "B" on Pier 27. The new plant with its four sacking machines can sack grain at the rate of 1 sack every 2 seconds, equivalent to 60 bus. per min. A specially constructed spout through the shipping gallery at Elevator "B" feeds the grain to the sacking machines and after being sacked is mechanically directed to box cars for loading and delivery to other piers.

### NORRIS BUILDING TOLEDO ADDITION

The Norris Grain Co. has started construction of a 500,000-bu. addition to its East Side Iron Elevator in Toledo, Ohio. It will consist of 10 steel tanks, each 40 ft. in diameter and 50 ft. high. Linked together, they will be of the self-cleaning, concrete hopper type, Paul Atkinson, local manager, states. Completion of the addition is due in the fall in time for the soybean harvest, and will give the company a 1,500,000-bu. total storage capacity at this plant. The company also operates the B & O Elevator, 400,000 bus. capacity, at 1308 Miami St., Toledo.

### GRAIN STORAGE FLEETS

The USDA has dropped any plans to use vessels in the Gulf for grain storage since the New Orleans elevator (which is the only facility in that area with a marine leg) cannot be taken out of grain export activities.

There still remains the possibility

that the Cargill elevator at Albany can handle a considerable volume of grain in ship storage.

### NEW HEAD HOUSE FOR ECKHART

The B. A. Eckhart Milling Co., 1300 W. Carroll Ave., Chicago, is building a concrete head house replacing the old wood house, and wheat tempering bins. Macdonald Engineering Co. has the contract.

### HUSKISSON LEAVES ALTON ELEVATOR

C. Herman Huskisson is taking a short vacation after resigning on July 1 as elevator superintendent for the Russell-Miller Milling Co., Alton, Ill. Mr. Huskisson is going to stay in the elevator field but his future plans are as yet undecided.

### OHIO ELEVATOR RECEIVING

Howard A. Walton's 125,000-bu. elevator is nearing completion and newly harvested grain is being received. The elevator stands on the site of the former Forest flour mill on Gromley St. The Pennsylvania and New York Central railroads are installing side tracks to the plant. William Hougendobler is manager.

### NEW METHOD OF BUILDING STORAGE

Emrik Lindman of Sweden who arrived recently as a passenger aboard the Swedish-American liner *Stockholm* came here to introduce a new revolutionary method for the construction of storage bins.

According to Mr. Lindman, a bin 60 ft. high can be built by six men in less than 24 hrs. The new method of construction, which is his own invention, has been employed in various countries as well as for military purposes.

### ROSENBAUM ELEVATORS SOLD

Rosenbaum Brothers, Chicago, last month sold their 1,000,000-bu. elevator at Indiana Harbor to the Iowa Farmers Grain Dealers Ass'n of Des Moines. Also a 110,000-bu. elevator at Morris, Ill., and one of 400,000 bus. capacity at Savannah, Ill., was sold to Cargill, Inc., of Minneapolis.

The 2,500,000-bu. Calumet Elevator at Chicago previously operated by Rosenbaum Brothers was taken over Aug. 1 by the Norris Grain Co.

Rosenbaum Brothers retain their Belt Elevator at 87th St. and Stewart Ave., Chicago, and houses at Omaha, Neb., and Winona, Minn.

The Minneapolis and Omaha offices will be operated as before. The firm does a large hedging business, which is not affected, the only difference being in the Chicago cash grain business.

Also continued are the feed manufacturing plants at Chicago, Mon-



mouth, Ill., and Dayton, O., operated by a subsidiary, the Vitality Mills, Inc.

### BUTLER-WELSH TO ENLARGE

The Butler-Welsh Grain Co., Omaha, Neb., has announced that work will start immediately on construction of an additional 300,000-bu. grain storage at its elevator in Nebraska City. The new addition will give the company total storage in Nebraska City of 670,000 bus.

### ADD MILL STORAGE IN WICHITA

A new 1 million-bu. reinforced concrete addition of the latest fireproof type will be built by Kansas Milling Co., Wichita, Kans., bringing the mill's aggregate storage facilities to 3,100,000 bus. Completion is expected by September.

### ANOTHER NEBRASKA ELEVATOR

The Holdredge Equity Exchange, Holdredge, Neb., is building a new all-concrete, nine tank elevator which will be completed by fall. The structures will stand more than 145 ft. in height and will have capacity of 250,000 bus, more than five times the present Equity storage space.

### BOMBER PLANT TO HOUSE GRAIN

The large bomber plant at the Cleveland Airport will be used for grain storage. Reports say 3,600,000 bus can be stored there without further reinforcements of the floor. If concrete is packed under weaker portions of the floor, 28,800,000 bus. more can be stored.

The Duffy Constr. Co., which leases the huge war-built plant from the Air Force, will continue to manage the plant as a warehousing operation under contract with the U. S. Dept. of Agriculture. Chris Kainrad of the Production & Marketing Division of the Dept. of Agriculture, has approved the facilities for grain storage.

### WHEAT EXPORTS ON "OPEN END" QUOTA

Effective immediately wheat exports to all countries outside the Western Hemisphere and the Philippines will be on an "open-end" quota basis, announced The Dept. of Agriculture on July 13. This means there will be no limits on quantities that may be shipped to any of these countries. Exports to Western Hemisphere countries and the Philippines will continue free of all restrictions.

The Commodity Credit Corporation will continue to supply wheat to all areas outside the Western Hemisphere and the Philippines, with the exception that quantities not in excess of 100 long tons may be exported through commercial channels.

The CCC will make periodic announcements of quantities and destinations of wheat to be supplied by CCC on specific requests and requisitions from the Army, ECA and cash-paying countries. Announcements will also include the quantities of coarse grain and flour being supplied by CCC.

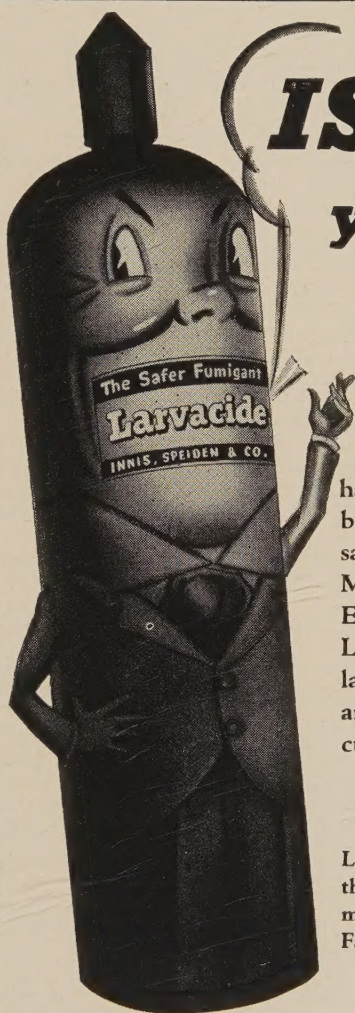
The CCC will supply: (1) wheat flour for the Occupied Zones of Germany and the Pacific, Austria, China, Greece, and Trieste, and (2) coarse grains for the Occupied Zones of Germany and the Pacific, Austria, China, Greece, Trieste, and other countries which may request the CCC to supply coarse grains.

In Current Export Bulletin No. 535, issued on July 8, the Depart-

ment of Commerce announced the de-control of exports of grains other than wheat. On those grains, as in the case of flour during recent months, there are now no export restrictions except that export licenses are required for quantities going to European countries and some adjacent areas.

### FIRE LOSSES IN 1948

The Mill Mutual Fire Prevention Bureau in a recent statement says that 11 mills, nine grain elevators and five grain, hay, seed and feed warehouses burned last year—each with a loss of more than \$100,000. Twenty-five large fires destroyed \$6,300,000 in grain, buildings and machinery.



## ISCONTROL your Weevil problem!

When you use LARVACIDE, you get control plus! LARVACIDE not only handles granary weevil and rice weevil, but is also deadly to lesser grain borer, saw-toothed grain beetle, flat grain beetle, Mediterranean flour moth and grain mites. Easily applied when receiving or turning, LARVACIDE's kill includes egg life and larvae. There's no explosion or fire hazard, and LARVACIDE's tear-gas warning cuts accident risk.

### KILLS RATS TOO!

LARVACIDE at low economical dosage drives them out on the open floor to die, where they may be swept up without carcass nuisance! Fast airing—overnight exposure.

**ISCOSPRAY  
SERVACIDE**

Contact and fume sprays with LASTING KILLING POWER! Use on bin tops and bin bottoms, when empty.

**INNIS, SPEIDEN & CO.**

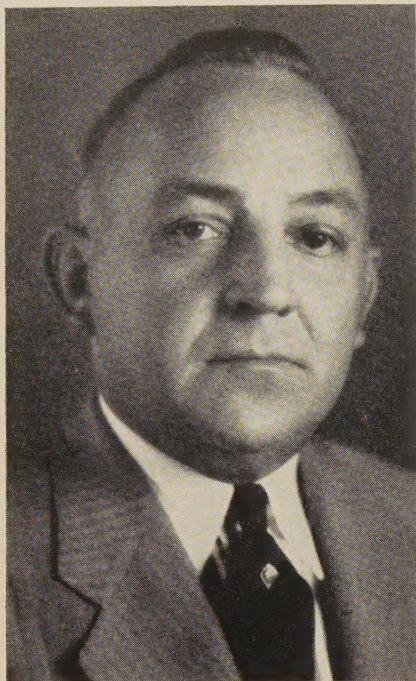
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**Larvacide**  
CHLORPICRIN

You can get your supply of LARVACIDE in handy 1-lb. bottles, 12 to wooden case, or in cylinders from 25 to 180 lbs.



# THE PRESIDENT'S CORNER



**CHARLES J. WINTERS**  
New Orleans

BY mutual confidence and mutual aid, great deeds are done and great discoveries made—Homer (900 B. C.). Mankind learns—but slowly. What was so clearly understood by the ancient Homer, apparently is not so well understood by our own generation.

Mutual confidence and mutual aid is the foundation upon which mankind

could build peace for his world; progress for his community and his nation; good will and human understanding for his industry.

Because it was built on just such a foundation, the Society of Grain Elevator Superintendents, over a score of years, has grown and prospered until today it represents a potent influence for good wherever grain is handled.

This issue of GRAIN will mark another milestone in the Society's progress. New and more vigorous policies have been inaugurated and a veteran editor has been added to the staff. Improvement will be gradual but sure. The doctrine of mutual confidence and mutual aid, on an even larger and brighter pennant, will continue to fly from our masthead.

It is to be hoped that these measures will succeed in winning the attention and, perhaps, even the support of those whose attention and support the Society has the best of reasons to expect—the grain elevator owners and operators whose superintendents have not yet been enrolled as members of the Society.

Every shred of useful information, every distinction acquired by the individual member, redounds to the credit of his owner-operator employer. Every accomplishment, every achievement of the Society organizationally must inevitably profit the entire industry.

Is it too much to ask then that the ENTIRE industry give the Society its unqualified approval and support?

Perhaps no industry in North America today is in more need of unified organizational action than is our own. Surely, no group of men anywhere are more qualified to wear proudly the badge of loyalty than are these men of North America who are charged with the re-

sponsibility of supervising the operation of grain elevator plants.

With this in mind your new administration devotes itself to a program of expansion—a program designed to win the good will, to deserve the support of all who are sincerely interested in our industry's future development—so that, by mutual confidence and mutual aid we shall be enabled to join solid ranks with all those who seek for this industry a fuller, freer, unshackled Destiny.

## CHICAGO CHAPTER PLANS TOURS

An Executive Board meeting of the Chicago Chapter of SOGES was held July 12 in the Spur Room of the Atlantic Hotel. The following men attended:

Lincoln Scott, Corn Products Refining Co., President; Harry S. Hanson, Vice-President, The Glidden Co.; Dale E. Wilson, Northwestern Malt & Grain Co., Secretary; Dean M. Clark, Nat'l. Secretary; Newton C. Evans, Editor of GRAIN.

Directors: Russ Paarlberg, Edward P. Escher, N. E. Bartlett, E. R. Anderson, Lloyd E. Forsell.

The meeting was called to order by Lincoln Scott with an expression of welcome to the new officers, and to Newton C. Evans, who is now associated with Dean M. Clark in the publication of grain magazines. Mr. Scott then declared the purpose of the meeting, was to discuss proposed activities for the coming year and to appoint committee members to assume charge of these activities, as well as committee members to take charge of the customary functions including new memberships, attendance, safety, dust explosions, etc.

Mr. Scott was presented with an antique teakwood gavel by Past-Pres. Anderson.

Several suggestions were made regarding proposed outings; Mr. Escher thought it would be pertinent that each member in charge of a committee take the group through his own plant wherever possible. Mr. Bartlett felt that a greater number of members would attend the outings if their wives and children were permitted to accompany them, and said that perhaps when the men visited some plant that would hold little or no interest for the ladies, some other program could be provided for them as a time fill-in until the plant visit was completed, at which time they would rejoin the men for a social hour or two.

Tentative dates and trips were suggested. A complete schedule will be adopted at the next meeting and committees appointed. The two next meetings will be:

Tues., Aug. 9—Japanese trip pictures and talk by Lincoln Scott.

Saturday, Sept. 17—Decatur, Ill., Staley Mfg. Co., Archer-Daniels-Midland Co., Spencer Kellogg & Son. Committee—Harry Hanson, Harold

**YOU'LL FIND "NU-HY" BUCKETS EVERYWHERE  
...RENDERING OUTSTANDING PERFORMANCE**

This bucket is scientifically built and answers the need for the "tops" in elevator leg efficiency. It carries heaping loads—picks up grain gently—discharges smoothly and efficiently. No backlegging. Learn how you can increase your elevator leg capacity by changing over to NU-HY'S. Write for Capacity Analysis Form No. 76. We can show you how to improve conditions without costly alterations.

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GRAIN BUCKET  
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• • •  
**GRAND BEACH FROLIC**  
 When the Chicago Chapter of SOGES held a combined outing and meeting recently at Grand Beach Lodge, Grand Beach, Mich., the ladies (and some of the men) found the white sand beach the greatest attraction. Here are two typical groups photographed by Gilbert Lane and relayed to us.  
 • • •



Wilber, Norman Nelson, Delmond Sensenbaugh, Dunkin Welte.

Another meeting was held on Tuesday evening, July 26, with Pres. Scott in chair. Arrangements were completed for the August 9 dinner-meeting which will be held at Martin's, 120 South La Salle St. at 6 p.m., ladies being invited. Dates for the coming tours will be decided at this meeting.

The following committee chairmen were appointed with power to select their own committee members: New Membership, Harry Hanson; Attendance, Dean M. Clark; Fall Outing, Lloyd E. Forsell; Associates' Night, N. E. Bartlett; Ladies' Night, Rudy Skala; June Outing, Gilbert Lane.

## SOGES CHAPTER DATES

**1st TUESDAY** — Minnesota SOGES Chapter. Ernest O. Ohman, Osborne-McMillan Elevator Co., Minneapolis, President; James Auld, Hales & Hunter Co., St. Louis Park, Secretary.

**2nd TUESDAY** — Omaha Council Bluffs SOGES Chapter. John T. Goetzing, Rosenbaum Bros., Omaha, President; W. S. Pool, Nebraska-Iowa Elevator, Omaha, Secretary.

**2nd FRIDAY**—Central States SOGES Chapter. M. M. Darling, The Glidden Co., Indianapolis, President; N. R. Adkins, Ralston Purina Co., Lafayette, Secretary.

**3rd TUESDAY**—Kansas City SOGES Chapter. Ralph Yantzi, Wolcott-Lincoln Grain Co., Kansas City, Kan., President; Robert T. Congrove, Standard Milling Co., Kansas City, Kan., Secretary.

**3rd TUESDAY** — Chicago SOGES Chapter. Lincoln Scott, Corn Products Refining Co., Chicago, President; Harry Hanson, Glidden Co., Chicago, Vice-President; Dale E. Wilson, Northwestern Malt & Grain Co., Chicago, Secretary.

**3rd THURSDAY**—Buffalo SOGES Chapter. Cornelius Halsted, General Mills, Inc., Buffalo, President; James Burns, Pillsbury Mills, Inc., Buffalo, Secretary.

## RESERVE NOW FOR NEW ORLEANS CONVENTION

THE CITY of New Orleans — home of Pres. C. J. Winters — was selected for the next annual meeting of the Society of Grain Elevator Superintendents. The dates are Feb. 28 to Mar. 4 and headquarters, Roosevelt Hotel. However, due to the crowded hotel situation it is not going to be possible for all members to be housed in the convention hotel.

Pres. Winters urges that reservations be made as soon as possible. When the allotment of rooms at the Roosevelt has been exhausted, reservations will be turned over to the next nearest hotel and so on down the list. First-come, first served—is the rule, and there is special need for haste since the meeting will be held just a week after Mardi Gras. Many of the Carnival visitors will stay over for a while.

If the hotel does not immediately acknowledge your reservation write to Pres. C. J. Winters, Public Grain Elevator, New Orleans, or to Richard Swenson, No. 2 Canal St., New Orleans. Mr. Swenson, who is Public Relations Counsel for the Board

of Commissioners of the Port of New Orleans has been named General Convention Chairman.

## THE GREAT ILLUSION

The great illusion of recent years has been belief that the Federal government's resources are inexhaustible and free.

That illusion is responsible for the grants-in-aid program, under which nearly \$21½ billion in Federal funds are budgeted for state and local governments in fiscal 1950.

This program implies that the Federal government has resources outside those available to state and local governments.

Actually, all governments, Federal, state, and local, must be supported by the wealth and income of the same people. The Federal government has no resources other than these.

# SAFE, SURE FUMIGATION

WITH



## THE 4-WAY GRAIN FUMIGANT

Tetrafume kills all forms of insects, whether eggs, larvae or adults! Leaves no odor, taste or stain on grain or sacking.

**4-Way Protection . . .** (1) Tetrafume kills weevils and other insects in grain. (2) Removes musty or ground odors. (3) Lowers temperature of the grain, cuts danger of heat damage. (4) Retards damage from high moisture content.

**Does Not Burn or Explode . . .** Tetrafume is safe and easy to use. It is sprinkled directly on the grain and releases a heavy gas which slowly settles through the grain, giving complete penetration. Safe to handle. Non-poisonous. See your Douglas salesman —or write direct.



**FREE BOOK**

Fully explains how to protect your grain from damage by insects, heat, moisture, odors, rats and mice. Write today.

"PIONEERS OF SAFE INSECTICIDES"

**Douglas Chemical and Supply Company**

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BRANCH WAREHOUSES: INDIANAPOLIS, INDIANA; SPOKANE, WASHINGTON; MINNEAPOLIS, MINNESOTA; PORTLAND, OREGON



## SOYBEAN POSTER

As an educational aid, the Seedburo Equipment Co., 726 Converse Bldg., Chicago, is now distributing a colorful wall poster to grain elevators, processing plants, etc., outlining the eight-step procedure in grading soybeans under the revised regulation of the Grain Branch of the U. S. Dept. of Agriculture.

The Seedburo poster also includes a chart listing the new soybean grades, describes the effect of the new standards on grading, and tells buyers how to solve the problem of conforming with the changes.

Persons interested in the new standards, and who have not received one of the Seedburo posters, may obtain a copy by writing for it.

## KILLED IN AIRPLANE CRASH

Charles Hosmer Morse III, Vice-President in Charge of Manufacturing, Fairbanks, Morse & Co., Chicago manufacturers, and eldest son of Colonel Robert H. Morse, President, lost his life when the company's big Lockheed Lodestar two-motor plane crashed near Roanoke, Ill., July 9, 1949.

"Hos", as he was best known by his host of friends and business associates, had been connected with Fairbanks, Morse & Co. since 1919.

He first worked at the Beloit plant. Honorably discharged as a wounded veteran of World War I he rejoined

the organization and worked in the company's factories at Three Rivers, Mich., Indianapolis, Ind., and St. Johnsbury, Vt. Later he was assigned to the concern's branches in many parts of the United States. He was at one time Assistant General Manager of the Beloit Works. He left Beloit in 1939 to become President of the Inland Utilities Company, a Fairbanks-Morse affiliate. On June 21, 1946, he was elected Vice President in Charge of Manufacturing. He is survived by his widow, daughter and two sons.

## S. HOWES CHANGES

Ed. J. Cecka, formerly sales manager of the Richmond Mfg. Co., Lockport, N. Y., has resigned that position to become sales manager of S. Howes Co., Inc., Silver Creek, N. Y. The change became effective on July 18.

A. C. Barbeau, Jr., Pres. and Gen. Mgr. of S. Howes Co., Inc., announces that E. C. Badenoch, sales engineer for Howes in the Chicago territory, has been made secretary of the company and will transfer his headquarters to the main office in Silver Creek.

## SEVEN MILLING COMPANIES WIN MERIT AWARDS

From the 4,200 corporation annual reports for 1948 submitted in the Ninth Annual Survey, conducted by Weston Smith of *Financial World*, these seven milling companies qualified for "Highest Merit Award" citations:

Arcady Farms Milling Co., Chicago; Central Soya Co., Decatur, Ind.; Froedert Grain & Malting Co., Milwaukee; General Mills, Inc., Minneapolis; Omar, Inc., Omaha (recently acquired by Colo. Mill & Elev. Co.); Pillsbury Mills Co., Minneapolis; A. E. Staley Mfg. Co., Decatur, Ill.

The stockholder reports of these companies have thus become candidates for the final judging, and one will be selected for a "Best of Industry" award and presented with a bronze "Oscar of Industry" at the *Financial World* Annual Report Awards Banquet on Monday, Oct. 31, 1949, in the Grand Ballroom of the Hotel Statler in New York. A year ago the 1947 annual report of A. E. Staley Mfg. Co. won the trophy in this industrial classification.

The independent board of judges in this year's competition is under the chairmanship of Dr. Lewis H. Haney, professor of economics at New York University, and he is assisted by Dr. Glenn Griswold, publisher of Public Relations News; Sylvia F. Porter, financial editor of the *New York Post*; Elmer C. Walzer, financial editor of the United Press; Dr. B. Bernard Greidinger, C.P.A.; and Paul Carlyle, executive vice president of Van Diver & Carlyle, Inc.

## HAMILTON RUBBER PROMOTES TODD

H. H. Todd, who has been in charge of Middle West Sales for Hamilton Rubber Mfg. Corp. and who is well known to Chicago elevator superintendents, has been elected vice-president of the corporation, whose home is in Trenton, N. Y.

## SLEPICKA TO HANDLE ADVERTISING

Frank Slepicka who has been doing a difficult job very creditably in the past few months, by handling several departments of GRAIN will now devote his time and ability to the advertising end of the paper. It's gratuitous information that as advertising increases, it is possible to put out a much better paper. So Frank and the rest of the staff are all tuned up for mighty efforts.

## FIRE DETECTING THERMOSTAT

DETECT-A-FIRE, the first fire detecting thermostat to maintain flat response at its operating temperature for all normal rates of rise, is announced by Fenwal, Inc., 23 Pleasant St., Ashland, Mass. The thermostat is listed for hazardous locations by Underwriters' Laboratories, Inc., and signals instantly at danger point of surrounding air, is explosion-proof, and repeatable. Literature describing the DETECT-A-FIRE may be had upon request to Fenwal, Inc.

## HORMONES FROM SOYBEANS

Large-scale production of steroid hormones has begun in the new plant of Sterol Derivatives, Inc., in Los Angeles. Production of progesterone and ethinylestradiol is already under way.

In the near future it is anticipated that the following hormones will be produced: testosterone, methyltestosterone, testosterone propionate, estradiol benzoate, estradiol, estrone, and other estrogenic substances.

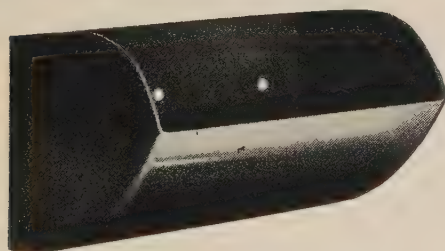
The hormones currently in production are derivatives of stigmasterol and sitosterol, obtained from soybean oil foots.

## NORTHWESTERN MILLER CHANGES

Robert E. Sterling has resigned as editor of *The Northwestern Miller* and as manager of the company's Kansas City branch office. He continues as a director and chairman of the board of the Miller Publishing Co.

Mr. Sterling has been a member of the staff of *The Northwestern Miller* since 1898, when he founded the Kansas City office. Upon the retirement of the late William C. Edgar in 1924 he became editor, and he has served continuously since that

Weller Pat.  
No. 1,944,932



**Chinese Doesn't  
Mean Anything  
To An Eskimo**

Capacity doesn't mean anything either unless an elevator bucket discharges completely.

The high speed

**CALUMET SUPER CAPACITY ELEVATOR CUP**

is scientifically constructed with a patented Logarithmic Curve design that provides maximum load capacity and assures a complete discharge. Operates efficiently over any sized pulley at any permissible speed.

**ASK YOUR JOBBER**  
Immediate delivery on most sizes.

**B.I. WELLER CO.**

327 S. La Salle St. Chicago 4, Ill.  
Thirty Five Years Of Service To The Grain Industry



year as chairman of the board. During the past four years illness has laid increasing claim upon his physical resources.

William C. Nichols, who became a member of the business staff of the Miller Publishing Co. in 1899 after 14 years of service in the British Army, the Natal Mounted Police and the Canadian Northwest Mounted Police, has also achieved retirement status. He will continue as vice president and director. In 1901 Mr. Nichols established a branch office for the company at Indianapolis. Returning to Minneapolis in 1904 he has been for most of the ensuing years business manager.

Succeeding Mr. Sterling as editor is Carroll K. Michener, who has been managing editor since 1925. Harvey E. Yantis and Martin E. Newell have been named associate editors. Milton B. Kihlstrum, news editor, succeeds Mr. Michener as managing editor.

#### OXYGEN THERAPY UNIT

A bulletin describing the M.S.A. Oxygen Therapy Unit, a professionally designed instrument for administering oxygen on a demand-regulated

basis, made be obtained by writing Mine Safety Appliances Co., Pittsburgh 8, Pa. The unit is designed for industrial use in plants for treatment of cases where oxygen administration is indicated. Bulletin CW-3 provides complete information.

#### BAG SEWING CONVEYOR BULLETIN

The Richardson Scale Co., Clifton, N. J., has just published a bulletin describing its new V-Belt Bag Sewing Conveyor for use with post-mounted bag closing machines.

The conveyor is designed primarily to automatically transport filled bags from Richardson weighing and packing equipment on through the sewing operation. Filled bags are dropped directly from packer on to conveyor and progress automatically to sewing station where limit switch stops bags at the needle of sewing machine. One man can pack and close from 4 to 8 bags per man-minute with the unit, and the conventional two-man system makes even higher speeds possible.

The bulletin illustrates the complete conveyor unit in detail and includes a close-up of the drive end.

## THE BARLEY BIN

#### BARLEY QUIZZIFICATION

THE current issue of GRAIN magazine carries this new department—a column devoted to the furthering of barley education and should be of interest to a great many grain men. With a little co-operation on the part of the readers (in the form of questions they would like answered and new material they can pass along), the Barley Committee formed in Minneapolis last May will endeavor to keep GRAIN supplied with enough material to make this column a monthly feature.

The problem is not so much getting material but rather in which direction to go to benefit the majority of the readers and the only way we can tell is from your comments and questions.

With this thought in mind don't wait for somebody else to ask the questions—drop a line today either to the Editor or to any of the committee listed below:

Dale Wilson Northwestern Malt & Grain Co., 4600 West Cortland St., Chicago 39, Ill.

Lloyd Forsell—Schwill Malting Co., 103rd and Ave. C, Chicago, Ill.

Henry Anderson—Bunge Corp., 917 13th Ave. SE., Minneapolis, Minn.

E. Josephson—Schreier Malting Co., Sheboygan, Wis.

John Berlander — Manitoba Pool Elevators, Fort William, Ont.

#### ONE VARIETY MALTING BARLEY COMMUNITIES

To encourage the production of uniform, high quality malting barley, three counties were selected in January, 1949, to try the "One Variety of Malting Barley Community Plan." These counties are Norman County (Ada) Minnesota; Cass County (Fargo) North Dakota; Turner County (Parker) South Dakota.

Under this plan, barley growers, local grain elevators, grain firms at terminal markets, maltsters and industrial users of barley malt should all benefit. A single malting variety will tend to command market premiums, such as are paid for one variety malting barley that is free of objectionable mixtures. This, instead of market discounts, such as are assessed against cars that contain varieties unsuited and unapproved for malting purposes. As dependable supplies of uniform, high quality malting barley are made available in the one variety communities, shipping stations in these communities should acquire and hold high standing in terminal markets as sources of top quality malting barley. Approved varieties, with no mixtures of two-row barley or poor malting varieties of six-row barley, as well as uniformity, are of paramount importance to the maltster and malting brewer.

**DON'T LET  
X  
Mark the Spot**

**FOR  
EFFECTIVE  
DUST AND GAS  
PROTECTION**

**ROBERTSON Explosion  
Ventilators**

**WILL**

Remove the more explosive fine dust from the leg by continuous gravity action

**WILL**

Release pent-up gases and flames in case of an explosion

**WILL**

Minimize the possibility of a secondary explosion by continuously venting gases

**ROBERTSON Ventilation  
Engineers**

**WILL**

Inspect your elevator and recommend proper sizes and number of ventilators to secure maximum protection at minimum expense.

**Write Now for Details**

**H. H. ROBERTSON CO.**

**Farmers Bank Building  
Pittsburgh, Pa.**



## CONTROLLING INSECTS IN BOOTS

(Concluded from page 7)

intervals. The superiority of these fumigants is attributed to their relatively low volatility and high toxicity. These fumigants evaporate slowly and tend to be retained in the dead stock and continue to kill insects entering the boots for appreciable periods after application.

Therefore, the results obtained under practical plant conditions appear to confirm the suggestion, based on laboratory findings by the senior author, that fumigants of low vapor pressure are likely to be more efficient spot fumigants than high vapor pressure compounds.

No significant difference was demonstrated between ethylene dibromide mixture applied at the rate of 10 to 12 fluid ounces per boot, and pure ethylene dibromide or dichloroethyl ether deposited on a blotter on the floor of the boot at the rate of 2 fluid ozs. per boot.

The marked effectiveness of the ethylene dibromide mixture is therefore clearly due to the ethylene dibromide content. Dichloroethyl ether has not previously been used as a spot fumigant in milling plants but appears to merit consideration for this purpose.

### Effectiveness of Pyrenone Applied in Elevator Boots and Legs

Although the pyrenone treatments were applied every second month over the six-month period, the effectiveness of monthly treatments can be assessed by the counts obtained for the month immediately following treatment. This is done in Fig. 2, which compares the average number of insects recovered from boots treated with pyrenone and from boots that were cleaned monthly.

Fig. 2 shows that when pyrenone was applied to boots alone, significantly more insects were present than in boots that were merely cleaned every month. This actual increase over untreated boots is especially marked at the end of the second month following treatment, but is also apparent one month after treatment.

When both the boot and the leg were treated with

pyrenone, there was a marked reduction in the average number of insects recovered, both at two months and one month after treatment. This improvement is clearly due to treatment of the legs, since treatment of the boots alone gave no reduction but an actual increase over untreated boots.

However, when legs were treated with the pyrenone aerosol, the reduction in numbers was comparable to that achieved with the acrylonitrile fumigant mixture. Though this degree of control is not considered satisfactory, the important point is the demonstrated value of treating the legs in any measure designed to reduce infestation of boots.

The importance of insect invasion of boots from the legs is further illustrated in Fig. 3, which shows the number of adult insects recovered from certain samples as soon as they were taken. Boots to be cleaned, and boots to be treated with pyrenone, were cleared of all stock and insects each month. Therefore, any adult confused flour beetles present in these boots one month later could not have developed within the boot but must have entered it as adults or larvae.

Under certain conditions, the flat grain beetle may complete development from egg to adult in less than 28 days, and some of the adults recovered may have developed from eggs laid in the boot during the first few days of the monthly periods. However, lumping both species, the number of adult insects recovered in the samples appears to give a good measure of the extent of invasion of boots by insects, presumably from the legs.

Fig. 3 shows the number of adult insects recovered from cleaned and from pyrenone-treated boots in September and November. In both months, the results obtained in cleaned boots indicate that insects normally enter the boots in appreciable numbers.

Boots treated with pyrenone showed larger numbers of adult insects than cleaned boots. (From an address delivered the recent AOM Convention in Toronto, Ont.)

## Books Received

### HELP YOURSELF TO BETTER SIGHT

By Margaret Darst Corbett. 216 pages. 16 chapters with incidental illustrations and accompanying practice cards and charts. Published by Prentice-Hall, Inc., 70 Fifth Ave., New York City. Price \$2.50.

Here is a book designed not merely for the elevator superintendent but for universal use. Poor eyesight exists everywhere and in many cases can be corrected or improved. The

author likes as a basic fact that relaxation is the secret of the art of seeing. Then she shows how to apply the so-called Bates Method to visual defects. The text is written in easy, simple style and interests the reader from the outset. Since this method is no longer a mere theory, but has been accepted as a major technique in eye education, this work possesses a positive value for nearly everyone. There is one chapter on the training of small children's eyes which will be particularly helpful to parents. In general, too, we'd say that the reader will be so fascinated by the possibilities of better eyesight that he will try the exercises laid down in the book and find that he profits by them.

### PRINCIPLES OF SALARY AND WAGE ADMINISTRATION

By A. W. Barbour, 10 chapters. 117 pages. Cloth binding. Published by the National Foremen's Institute, Inc., Deep River Conn. Price \$2.50.

There are few executives or administrators who can't get something of value from this compact, informative book. The chapter on Fact Finding and Job Evaluation is especially noteworthy. With the wage question now probably the most important factor in operating business or industries such a book will be sought for and read. The appendices giving some practical applications and examples will also be found quite valuable.

### CORN-FACTS AND FIGURES

A 48-page reference book published by limited free distribution by Corn Industries Research Foundation, New York City.

This is the 1949 edition of earlier publications under the same title which have been issued at 2-yr. intervals. Statistics and charts on the U.S. and world corn crop have been brought up to date. Many pages of text discuss the importance of corn in America to the farmer, to livestock and to industries. Some 500 uses of corn products, as food for humans and as the raw materials for many industries, are listed.

## BRUSHES RIGHT—FROM THE START— In Quality and Workmanship



WRITE  
FOR  
PRICES.



### Separator Brushes

We can furnish separator brushes for any machine.

### The STAR Warehouse Push Broom

This is the broom that is used by most large terminal elevators for sweeping grain out of box cars.

Brushes for Every Commercial and Industrial Use

FLOUR CITY BRUSH CO., Minneapolis 15, Minn.



## IN THE HOPPER

"Boy, ah's skeered. Ah jes' got a letter from a man tellin' me he'd cut my heart out wid a razor iffen ah didn't stay away from his wife."

"Well, all you got to do is stay away from his wife."

"Yeah, but he didn't sign his name to de letter!"

\* \* \*

Gil Lane was far out in the rough. He turned to his caddy and asked him why he kept looking at his watch.

"It's not a watch, Mr. Lane," the caddy said, "It's a compass."

\* \* \*

The man was disconsolate. Everything he did was wrong. So he decided to end it all by hanging himself from a tree. Before he jumped he decided to explain to the Lord the reason for his action and raising his head poured out the anguish of his soul—how he was blamed when things went wrong, how others got credit for his acts of merit, how his wife misunderstood him etc. Just then a bird flew over and beautifully decorated one eye of his upturned face.

"You see, Lord," said the poor soul. "That's what I mean. For other people they sing."

\* \* \*

She: "Is that girl's dress torn, or am I seeing things?"

He: "Both."

\* \* \*

"Brothers and Sisters," the old preacher intoned. "Today I wants to preach to you on the subject of Liars. How many of you has read the 69th chapter of Matthew?"

About half the congregation responded by raising their hands.

"That's jes' fine; you is the ones I wants to talk to," said the preacher. "Dere ain't no such chapter."

\* \* \*

"Pa, my teacher told me that I was illiterate," announced the teen-aged Arkansawyer.

"The heck he did!" snorted the irate parent. "Well, you just take your birth certificate to school with you tomorrow and show him you aint."

\* \* \*

The sweet young thing had broken her glasses. She took the remains back to the optometrist. "Will I have to be examined all over?"

"No," he replied, "just your eyes."

\* \* \*

"Doctor, how do you really tell if a person is insane?"

"Oh, we merely ask him a few ordinary questions which ordinary people can answer correctly."

"What type of question?"

"Well," replied Dr. Fisher, "this is the sort of thing. Captain Cook made three voyages round the world and

died on one of them. Which was it?"

"Oh, I say," objected the questioner, "I think that's a bit steep. I'm not very good at history."

\* \* \*

John: Can't we get a fifth for our bridge game?

Bill: You dope! We don't need one.

John: Well, a pint anyway!

\* \* \*

Boy: "Yes, my dear, I am a self-made man."

Girl: "That's what I love about you, Bill. You always take the blame for everything."

## SICK WHEAT

(Concluded from page 4)

milled fractions of sick wheat affected by this deterioration more than others? Can treatments be devised to counteract losses in quality due to sick wheat in the mill mix? Are there more economical means for the utilization of germ-damaged wheat than exist today? All of these questions are worth investigating.

Another problem as yet unsolved is the nature and mechanism of the formation of the dark pigment which appears first in the germ and then in the other portions of sick wheat. Is this pigment the product of oxidizing enzymes, or is it due to a browning reaction independent of enzyme activity, but favored by factors such as moisture and temperature? Once the nature of this process is known, remedial procedures can be suggested.

### Sick Rye, Too

The question of varietal differences has been raised in the sick wheat problem. It once was believed that only soft red winter wheats were susceptible to sick wheat damage. While it is true that this deterioration is most common in this class of wheat, we know, however, that southwestern hard red varieties and even red spring varieties are susceptible. In some areas sick rye has appeared. Does the possibility exist, therefore, that certain varieties are more susceptible than others? It would be very useful to have an answer to this question.

Other aspects of the problem also need clarification, as for example, the theory of infection which was previously mentioned. The exact role of various enzyme systems in the grain also needs to be clarified.

To state the problem in general terms, one can say that difficulties associated with the storage and marketing of grain are at present causing serious economic losses. These problems can only become more serious since we face the possibility of storing a huge wheat crop in the coming year for a period prior to utilization, longer than has been the practice heretofore.

In the face of the present and foreseeable contingencies, no adequate program of research into these problems is under way. It seems obvious that we can solve these problems only to the extent that we attempt to understand them. A comprehensive research program, clearly outlined and vigorously pursued would provide the necessary information.

(From a paper presented at a recent meeting of the Texas Grain & Feed Dealers Ass'n, Galveston, Texas.)

## OUR VISITORS

VISITORS during the month of July to the home offices of GRAIN in Chicago, included the following: C. Wallace Clark, Anheuser-Busch, Inc., Springfield, Mo. E. P. Stimmel, Gruendler Crusher & Pulv. Co., St. Louis, Mo. Lee Brittain, Supt., Blair Elev. & Feed Mill, Atchison, Kans. John Neenan, Cereal Mill Engineer, Allis-Chalmers Mfg. Co., Milwaukee, Wis. Elmer Grant, Cargill, Inc., Superior, Wis. Oscar W. Olsen, Duluth, Minn., Retired Supt., Globe Elev. Div., F. H. Peavey & Co. Past Pres., SOGES. Harold C. Wilber, A. E. Staley Mfg. Co., Decatur, Ill., Past Pres. SOGES. W. A. Wiedenmann of W. C. Wiedenmann & Sons, Inc., Kansas City, Mo.



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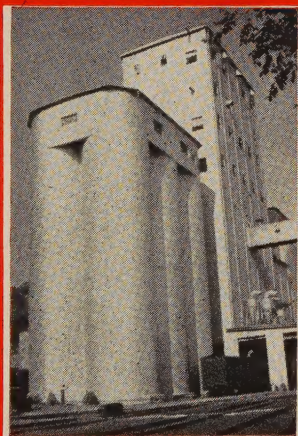
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